

ATTACHMENT FOR SPECIFICATION AMENDMENTS

The following is a marked up version of each replacement paragraph and/or section of the specification in which underlines indicate insertions and brackets indicate deletions.

[0002] Conventionally, examinations [on] of through holes each having a diameter of several ten ~ several hundred micron millimeters are generally conducted to check if a correct number of the through holes are opened, if the sizes of the through holes are uniform, if any foreign matters are present in the through holes, and the like. Optical methods are generally conducted for such examinations. For example, an area sensor camera is used to photograph an examining surface of a work piece where through holes are formed, and an image processing apparatus is used to compare the result with a reference value to make a determination as to whether or not the result is good. However, in the conventional example described above, beside the image processing apparatus, an auto-focusing unit, a microscope, and electron beams are required, whereby the examination is conducted for each one of the through holes, or with an expanded image that is expanded at a high level of magnification.

ATTACHMENT FOR CLAIM AMENDMENTS

The following is a marked up version of each amended claim in which underlines indicates insertions and brackets indicate deletions.

Claim 1. (AMENDED) A through hole examination method [characterized in] comprising:

irradiating light from one side of a work piece having a through hole; and

detecting passing light by imaging the passing light from [the other] another side of the work piece by a sensor camera having a plurality of imaging elements,

wherein the examination is conducted by imaging with an imaging focal point of the sensor camera being shifted with respect to [the] a surface of the work piece.

Claim 2. (AMENDED) A through hole examination method [characterized in] comprising:

irradiating light from one side of a work piece having a plurality of through holes;

imaging and detecting passing light from [the other] another side of the work piece by a sensor camera having a plurality of imaging elements,

wherein the imaging is conducted with a focal point of the sensor camera being shifted from [the] a surface of the work piece to obtain images corresponding to

the through holes, and areas of the images of the through holes are compared with one another [to examine differences or uniformity of the through holes or examine foreign matters in the through holes].

Claim 3. (AMENDED) A through hole examination method according to claim 1 [or claim 2], wherein a line sensor camera is used as the sensor camera, and the imaging is conducted by shifting the camera relative to and in parallel with the work piece.

Claim 4. (AMENDED) A through hole examination method according to claim 1 [or claim 2], wherein the imaging focal point of the sensor camera is shifted from the surface of the work piece to conduct imaging such that an area of an image of the passing light is expanded.

Claim 5. (AMENDED) A through hole examination apparatus comprising:
a light source;
a sensor camera having a plurality of imaging elements;
a table on which a work piece having through holes is mounted [being]
interposed between the light source and the sensor camera, wherein
the sensor camera is capable of imaging light passing through the through
holes, and

a relative position between the sensor camera and the surface of the work piece is set such that an imaging focal point of the sensor camera is shifted from a surface of the work piece; and

an image processing device [that] receives imaging signals provided by the sensor camera and performs a process for comparing imaged areas.

ATTACHMENT FOR ABSTRACT AMENDMENTS

The following is a marked up version of the Abstract in which underlines indicates insertions and brackets indicate deletions.

There are provided a method and apparatus for examining through holes, in which determinations as to whether the examined through holes_u are good or bad can be accurately made at low costs. A light source and a sensor camera having a plurality of imaging elements are disposed with a table_u on which a work piece having through holes is mounted_u [being] interposed between the light source and the sensor camera. Light passing through the through holes is imaged by the sensor camera, wherein the sensor camera is set such that a focal point of the sensor camera is shifted from the surface of the work piece to thereby apparently expand an area of the image of the passing light.